Newly Formulated Claims

1. Process for liquefying a hydrocarbon-rich flow, in particular a flow of natural gas, with simultaneous recovery of a C_3/C_4-rich fraction, whereby the liquefaction of the hydrocarbon-rich flow is carried out in heat exchange for at least one refrigerant and/or mixed refrigerant flow, and the hydrocarbon-rich flow that is to be liquefied, after precooling, is subjected to a rectifying column, in which higher hydrocarbons are separated from the hydrocarbon-rich flow that is to be liquefied, and then is subjected to further cooling and liquefaction, whereby a C_{2+}-rich fraction that is recovered in the subsequent cooling of the hydrocarbon-rich flow is fed to the rectifying column as a reflux liquid, characterized in that a C_4/C_5–rich fraction (20, 35) is fed to rectifying column (T1) as an additional reflux liquid, whereby the feed point of the C_4/C_5-rich fraction (20, 35) is located above the feed point of C_{2+}-rich fraction (5), and a mass transfer zone (M) is provided between the feed point of the C_4/C_5 -rich fraction (20, 35) and the feed point of C_{2+}-rich fraction (5).
2. Process according to claim 1, in which the higher hydrocarbons that are recovered in the rectifying column are separated by rectification in several steps, whereby one of these steps comprises the feeding of higher hydrocarbons in a depropanizer (T2), wherein the C_4/C_5-rich fraction (20, 35) that is fed to rectifying column (T1) as an additional reflux liquid is recovered in a depropanizer side column (T3), which is fed to a C_{4+}-rich fraction (14) that is drawn off from depropanizer (T2).

3. Process according to claim 1, in which the higher hydrocarbons that are recovered in the rectifying column are separated by rectification in several steps, whereby one of these steps comprises the feeding of higher hydrocarbons in a debutanizer, wherein the C_4/C_5-rich fraction (20, 35) that is fed to rectifying column (T1) as an additional reflux liquid is recovered in the debutanizer.
4. Process according to claim 1, wherein the C_4/C_5-rich fraction (20, 35) that is fed to rectifying column (T1) as an additional reflux liquid is recovered in a side column (T4) of rectifying column (T1) by a C_{4+}-rich fraction (30) being fed to this side column (T4) from rectifying column (T1).
5. Process according to one of the preceding claims 1 to 4, wherein the C_4/C_5-rich fraction (20, 35) that is fed to rectifying column (T1) as an additional reflux liquid is cooled before the feeding thereof (E5, E7).
6. Process according to claim 5, wherein the C_4/C_5-rich fraction (20, 35) that is fed to rectifying column (T1) as an additional reflux liquid is at least partially condensed in its cooling (E5, E7).
7. Process according to one of the preceding claims 1 to 6, wherein the benzene content of the C_4/C_5-rich fraction (20, 35) that is fed to rectifying column (T1) as an additional reflux liquid is less than 500 ppm, preferably less than 300 ppm.